

REMARKS

The Office Action dated August 12, 2004 has been received and reviewed by the applicant. Claims 41-45 and 49-51 are in the application. Claims 41-45 and 49-51 stand rejected. Claims 41-45 and 49-51 have been canceled. New claims 52 - 61 are added. Since the claims have been substantially modified, an attachment with the amended claims and the precise support locations is added for clarity in the examination process. Reconsideration is respectfully requested.

Claim 41 stands rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,130,741, in view of U.S. Patent No. 6,654,501. This claim is canceled so this rejection is now moot.

The drawings stand objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. The rejection states that the “watermarked image that contains a perceptible, but not objectionable watermark” is not shown. In response, proposed drawings are included herewith for showing this feature more clearly.

Claims 41-45, 49-51 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. More specifically, the rejection states that claims 41 - 45 and 49 - 51 include the phrase “substantial” which is indefinite. In response, the newly submitted claims omit these limitations.

Claims 41, 42, 44, 49 stand rejected under 35 U.S.C. 103(a) as being obvious over the combination of Acharya et al., U.S. Patent No. 6,654,501 (“Acharya”) and Wen et al., U.S. Patent No. 6,130,741 (“Wen”). In response, new claim 52 includes “producing a watermark carrier with a Fourier amplitude spectrum that matches the Fourier amplitude spectrum of the imaging system noise.” The rejection cites Acharya as teaching the steps of producing a watermark signal that has noise characteristics and combining the watermark signal with the image to produce a watermarked image that contains perceptible, but not objectionable watermark by having the watermark include a characteristic that is consistent with the noise characteristic. As understood by Applicants, in Acharya’s method, the watermark is sparsely distributed over the image into the smooth or non-texture regions (col. 4, lines 20-36 and col. 5, line 22 – col. 6, line

3). The motivation for this spatially distributed approach is to make the watermark imperceptible to a human observer (col. 6, lines 63-67). The sparse nature of the watermark in Acharya's method does not allow for matching the noise characteristics of imaging systems, e.g., film grain, which typically affect all pixels in the image. Moreover, Acharya does disclose or suggest that the watermark could be constructed so as to match the Fourier amplitude spectrum of imaging system noise or that the watermark amplitude could be adjusted at each pixel location to match a desired noise standard deviation. Furthermore, the rejection cites Acharya as teaching the step of removing an existing noise characteristic prior to watermarking an image (col. 3, lines 1-4), but further reading of this passage (col. 3, lines 5-8) clearly shows that Acharya is only concerned with the corruption of existing watermark information by the noise reduction and does not disclose or suggest the idea of removing existing system noise to prevent a noise increase when a watermark is added to an image.

Wen (6,130,741) teaches the embedding of message data using watermarks that are adjusted based upon film grain noise characteristics (col. 4, lines 59-63). However, Wen explicitly states that the watermark is designed to be visually undetectable (col. 5, lines 27-29 and col. 5, lines 54-61). Wen does not disclose or suggest that one should make the watermark perceptible in accordance with the film grain noise characteristics. Moreover, Wen does not suggest that the Fourier magnitude spectrum of the watermark should match a desired Fourier magnitude spectrum. Indeed, Wen states that the preferred method is "... the carrier signal should contain all frequencies at equal amplitude." (col. 6, lines 46-47), i.e., the carrier spectrum should be flat. This is contrary to the present invention where the carrier spectrum is shaped to match imaging system noise.

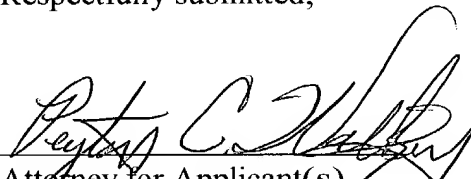
Gray (5,641,596) discloses characterizing noise in film-based systems via spatial correlations coefficients, i.e., the equivalent of a Fourier amplitude spectrum. More specifically, Gray teaches placing a noise characteristic directly in an image (grain synthesis, col. 6, lines 18-59) or using a noise characteristic to reduce grain (grain smoothing, col. 5, line 17 — col. 6, line 17), but does not teach or suggest producing a watermark carrier. Therefore, Gray does not teach or suggest shaping a "watermark carrier" to match a desired Fourier amplitude spectrum to provide a visible watermark that is not objectionable as in claim 52. Moreover, modifying a carrier shape to provide

improved watermark performance while still maintaining the desired perceptual qualities (as per the current application on p. 13, line 12 to p. 14, line 13) is not found in the methods taught by Gray. Therefore, it is respectfully submitted that Gray individually or in combination with Acharya and Wen does not teach or suggest claim 52.

Should the Examiner consider that additional amendments are necessary to place the application in condition for allowance, the favor is requested of a telephone call to the undersigned counsel for the purpose of discussing such amendments.

For the reasons set forth above, it is believed that the application is in condition for allowance. Accordingly, reconsideration and favorable action are respectfully solicited.

Respectfully submitted,


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If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.